

The relationship of contraceptive use of KB pills with changes in acceptors' weight at Umbulharjo I health center

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Abstract. Contraception or anti-conception is an action that can be taken to prevent pregnancy. Birth control pills are an example of a popular hormonal contraceptive in Indonesia. The Contraceptive Prevalence Rate (CPR) or the level of contraceptive device users in Indonesia continues to increase from year to year from 57% in 1997, then based on the Demographic Survey in 2020, it reached 61.78% usage. Apart from the benefits, contraception certainly has several side effects, one of which is changes in body weight. The aimed of this study was to determine the relationship between the use of contraceptive pills with the changes in of acceptors' body weight at the Umbulharjo I Community Health Center. Research was conducted using quantitative research methods with an analytical survey design using a cross-sectional approach. The sampling technique used in this research was accidental sampling using minimum data, namely 30 samples. Statistical analysis using the paired samples correlation test shows a significance value of 0.00, $0.000 < 0.005$, and the paired sample t-test value obtained a sig (2-tailed) 0.03, $0.003 < 0.005$. From the results above, it can be concluded that there is a significant relationship and there is a difference in average weight before and after using contraceptive pills.

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1 Introduction

Contraception, or birth control, is an action taken to prevent conception or pregnancy. In modern times, many people choose to use hormonal contraception over non-hormonal methods because hormonal contraceptives are more accessible and more practical to use [1,2]. Family Planning (KB) is an effort to provide spacing between births, ideal age gaps between children, and to manage pregnancies for mothers [3]. Birth control pills (Pil KB) are one of the most famous examples of hormonal contraceptives used in Indonesia because users can easily manage them independently at any time. However, alongside their ease of use, there are side effects that may occur after use, such as acne, irregular menstruation, nausea, and weight gain [4].

Indonesia's Contraceptive Prevalence Rate (CPR) has steadily increased over the years, reaching 61.78% in 2020 [5]. In Yogyakarta city in 2019, the total usage of birth control pills reached 2,049 people, the lowest in the Special Region of Yogyakarta Province, while in Umbulharjo District, the usage rate was 6.29%, the highest among other districts in Yogyakarta city [6]. Compared to any other district in Yogyakarta, the Umbulharjo District has the fastest birth growth, accounting for 21,33% in 2017 [7]. It was reported in 2021, that Umbulharjo District was also considered to have a large coverage of birth contraception usage, with total acceptors nearly reaching 2500 females [8]. Taking the Sorosutan Subdistrict, for example, recorded data in 2020 showed about 975 fertile people participated in this national birth control program, counted as the highest number of participants compared to all other subdistricts in Umbulharjo District. In addition, from the latest report by Dinas Pemberdayaan Perempuan, Perlindungan Anak dan Pengendalian Penduduk dan Keluarga Berencana in 2023, eligible fertile age (EFA) in Umbulharjo District reaches the highest rank compared to 13 other districts in Yogyakarta (n=7570) with nearly half of them take hormonal contraception, either through injection or orally. Since the Sorosutan Subdistrict has the highest contraception coverage in the Umbulharjo District, the optimal data collection is usually based on public health facilities such as clinics or health centres. Umbulharjo I Health Centre covers 4 districts and 7 subdistricts, including the Sorosutan Subdistrict. Thus, the place is chosen to capture the real situation based on previously available reports [9].

Weight changes among birth control pill users can occur due to various factors, including hormonal side effects [10]. The hormones in birth control pills can contribute to weight gain among users. Previous research by [11] found that 62.5% of birth control pill users experienced weight gain, while another study by Muhammad Feni Samsul reported 67.4% of users experiencing weight gain. It is important to note that weight changes caused by birth control pills are not solely due to the pill's side effects; other factors, such as physical activity and dietary habits, also play a role.

The data above forms the basis for why researchers were eager to investigate the relationship between the use of birth control pills and weight among users at Umbulharjo I Health Center.

2 Material and Methods

This study was observational research with a cross-sectional approach to determine the relationship between the use of birth control pills and weight changes. Sampling in this study used an accidental sampling technique. The sample used in this sample is a minimum sample of 30 [12]. Samples are based on medical records obtained at the Umbulharjo I Yogyakarta Health Center. The use of the minimum sample is because the medical record data at the Umbulharjo I Yogyakarta Health Center does not have all acceptor data on the coverage area of the Umbulharjo District.

The study was conducted after permission was granted through an ethical approval statement (Number 012312327) from the UAD Ethical Commission. In this study, the variables under investigation are birth control pills as the independent variable and weight changes as the dependent variable. The research instrument used in this study involves secondary data, specifically medical records data, including weight, age, and the type of birth control pill used. These medical records data are processed initially to assess their distribution. Once the data are normally distributed, further data processing proceeds to the following steps: paired sample t-tests to find the mean ratio between the variables and paired samples correlation to determine whether there is a strong connection between the two variables.

3 Results and Discussion

3.1 Results

From the collected data, the analysis is separated based on demographic appearance and bivariate analysis. The baseline characteristics of the acceptors are displayed in Table 1. Table 1 shows that the total sample size is 30, with 9 (30%) using progestin birth control pills and 21 (70%) using combination birth control pills. Among them, five samples (17%) are under 25 years old, 14 samples (47%) are aged between 25-35 years, and 11 samples (36%) are over 35 years old.

Table 1. Frequency Distribution of Respondents Based on Gender

No	Characteristics	Frequency	Percentage
Type of contraception			
1.	Progestin	9	30%
2.	Combination	21	70%
Age			
1.	<25 Years	5	17
2.	25-35 Years	14	47
3.	>35 Years	11	36
Total		30	100%

The research results indicate that the majority of birth control pill users at Umbulharjo I Health Center use combination pills, precisely 21 samples (70%). Meanwhile, nine samples (30%) opted for progestin-only birth control pills. This finding is consistent with the study conducted by [13] which showed that 55% of users prefer combination birth control pills. The choice of combination birth control pills is favoured by many due to containing both progesterone and estrogen hormones simultaneously, unlike progestin-only pills, which contain only progesterone. Progestin-only pills are considered safer for women who cannot take estrogen-containing hormones.

Based on the research conducted at Umbulharjo I Health Center, it was found that the majority of birth control pill users fall within the 25-35 age range, totalling 14 samples (47%). Additionally, 11 samples (36%) were over 35 years old, and five (17%) were under 25.

Similar findings were reported by [14], stating that the majority of birth control pill users are aged 20-35 years. Yusran et al. [15] also found a similar trend, with 24.9% of users falling within the 25-35 age range. Age plays a significant role in the effectiveness of contraceptive use, as the 20-35 age range is optimal for fertility regulation. Therefore, effective pregnancy planning is crucial during this age period. Additionally, contraceptives with good reversibility, such as pills and injections, are particularly necessary during this phase of life.

Table 2. Frequency distribution of weight change data among acceptors

		Frequency	Percentage
Weight change	Up	19	63%
	Down	3	10%
Unchanged weight	Stable	8	27%
	Total	30	100%

Table 2 shows that out of 30 samples of contraceptive acceptors, 22 samples experienced weight changes, with 19 samples (63%) experiencing weight gain and three samples (10%) experiencing weight loss. In comparison, eight samples (27%) did not experience any weight changes.

Research conducted at Public Health Center Umbulharjo found that most contraceptive pill acceptors experienced weight changes, precisely 22 samples, where 19 samples (63%) gained weight, and three samples (10%) lost weight. Meanwhile, eight samples (27%) did not experience any weight changes. Similar results were also found in a study conducted by Ruliani (2017), which reported that 77.7% of samples experienced weight changes, with 71.1% gaining weight and 6.6% losing weight. The majority of contraceptive pill acceptors experienced weight gain, accounting for 19 samples (63.3%). This aligns with theoretical studies indicating that one of the effects of contraceptive pill use is weight gain due to the hormones progesterone and estrogen. Meanwhile, three samples (10%) experienced weight loss, and eight samples (26.7%) did not experience any weight changes, likely influenced by various factors such as physical activity and eating habits of the acceptors."

Table 3. Test paired sample correlations

	n	Correlation	Sig
Pair 1 During use & post use after one month	30	.939	.000

Table 4. Test paired-samples t-test

	Mean	Std Deviation	Std Error mean	t	Dif	Sig
Pair 1 During use & post use after one month	.80000	1.34933	-.24635	-3.247	29	.003

Table 3 shows that the correlation coefficient obtained a value of 0.939, which indicates a very strong correlation. The significance value in the paired samples correlations test is 0.00 because the significance value is $0.00 < 0.05$; it can be concluded that there is a relationship between the use of birth control pills and weight changes in acceptors at Puskesmas Umbulharjo I.

Table 4 shows that the Sig. (2-tailed) value is 0.03, which is <0.05 . Therefore, it can be concluded that there is a significant difference between weight before use and post-use after one month among birth control pill acceptors at Public Health Center Umbulharjo I.

3.2 Discussion

The results obtained from the analysis conducted on 30 patient samples that met the research criteria with paired samples correlations test and paired sample correlations. Table 3 shows the test results, wherein the paired samples correlation test, the Sig value obtained is $0.00 < 0.05$; it can be concluded that there is a relationship between birth control pill use and weight changes. In the paired sample t-test shown in Table 4, the result (2-tailed) is $0.03 < 0.05$, so based on this test, it can be concluded that there is a significant difference between weight before use and post-use after one month. Therefore, the initial hypothesis or H1 can be accepted, namely that there is a relationship between birth control pill use and weight changes. These research findings are consistent with previous studies by [16] titled "The Effect of Hormonal Contraceptive Devices on Weight Gain in Acceptors at Muara Badak Health Center, Kutai Kartanegara Regency." There is a similarity in the results of the paired sample t-test, with a significant consequence of $p=0.00 < 0.05$. This means there is a considerable weight change between before and after use in that study.

Another study by [17] titled "Oral Contraceptive Pills and Combination with Weight Changes in Acceptors" also showed similar results. The analysis of that study found a p-value of $0.001 < 0.005$. Hence, it can be concluded that H1 is accepted, indicating a relationship between oral contraceptive pill use and weight changes. However, this study's results differ from the [18] studies titled "Combination contraceptives: effects on weight," from 42 trials included in the systematic review, 40 trials comparing two or more combination contraceptives mostly did not show significant weight differences. One multi-centre open-label trial reported in the Lancet using 7829 respondents suggested strong evidence for females who take progestin-only hormonal contraception to gain significant weight after 12 to 18 months of use. The range of weight gain recorded is approximately 3.5-5 kg, and it is notably observed during the follow-up. However, those who only use the copper IUD are likely to show insignificant weight change [19].

Estrogen and progesterone are hormones contained in the contraceptive pill, each of which has the effect of preventing pregnancy, but the content also has several side effects. One of the side effects of estrogen in a high body is to reduce the protein Leptin, which functions to regulate appetite; the higher the leptin, the person's appetite will decrease, and vice versa. If the leptin content is low, the person's appetite will increase [20]. Progesterone also has side effects in weight change. This is because when Progesterone is taken orally, it will change the content of the lipid profile in the body through an increase in lipoprotein cholesterol density, which results in an increase in lipid content in the body and weight change. Research conducted by [21] suggests that women who use oral contraceptives have significantly increased body fat and weight. After 36 weeks, users increased their weight (+5.1 kg) and body fat (+4.1 kg). Another study was conducted by [22] regarding the effects of progesterone on mice. In the study, researchers observed the body weight of mice given progesterone injections for 21 days. Female mice given progesterone experienced a higher weight gain than female mice given placebo.

Accepting the hypothesis indicating a relationship between birth control pill use and weight changes means that if there is weight gain, this relationship can indeed occur due to several factors. Factors include hormonal factors like progesterone and estrogen, physical activity, lifestyle, and diet. Theoretically, weight gain due to these birth control pills is attributed to the hormones contained in the pills.

Weight loss with contraceptive use can occur due to factors such as an individual's eating habits. A study by [23] titled "Effect of oral contraceptive use on weight loss and body composition following low-calorie diet intervention". Showed that with calorie restriction during oral contraceptive use, weight loss could occur even with regular contraceptive pill use. Another study that had different results in this study was conducted by [24]. Among 150 women (54 obese and 96 normal weight) who used combined oral contraceptives for 3 to 4 months, there were no clinically or statistically significant changes in weight or body composition.

In this study, weight changes observed could be in the form of gain, loss, or no change in weight. Since this study did not observe data on the height of acceptors, the Body Mass Index (BMI) of individuals after using contraceptive pills cannot be determined. Measuring height and weight can be used to assess BMI and monitor ideal weight among acceptors.

4 Conclusion

Based on the data analysis conducted through paired samples correlations and paired sample t-tests, and the discussion on "The Relationship Between the Use of Birth Control Pills and Weight Changes in Acceptors at Public Health Center Umbulharjo I," the following conclusions can be drawn There is a significant relationship or correlation between the use of birth control pills and weight changes among acceptors at Public Health Center Umbulharjo I. This may be attributed to the hormones contained in these birth control pills, namely progesterone and estrogen. There is a significant difference between weight before use and weight after one month of use among birth control pill acceptors at Public Health Center Umbulharjo I. These conclusions are based on the statistical analyses performed, indicating a significant correlation and weight difference among the study participants.

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